CHARLES GOODYEAR

FATHER OF THE RUBBER INDUSTRY

by LEONARD M. FANNING

"FATHERS OF INDUSTRIES" SERIES

Goodyear persisted in invention despite sufferings in debtors' prisons

CHARLES GOODYEAR, Father of the Rubber Industry, was well acquainted with hardship and suffering. Even when he received a distinguished award for discovering the vulcanization of rubber, he was confined in a debtors' jail.

Often called crazy, Goodyear heard his ability questioned and his revolutionary invention termed "pure accident." Frequently he advertised and exploited his discovery with circus-like methods, for he was not overly modest. Basically, however, he was dedicated to research and entirely unconcerned with life's routine. His outbursts of exultation and display were sporadic, and because of bad luck or instability—fate, if you will—he was periodically imprisoned for debt.

The inventor's first acquaintance with debtors' prison—a survival of medieval times which Charles Dickens soon was to help to oblivion—came at the age of 30. Born at New Haven, Connecticut, December 29, 1800, Goodyear grew into a slender, delicate lad who aspired to the ministry. At 21, however, he became a partner with his father, Amasa, in one of America's early hardware manufacturing ventures. The 1830 depression brought failure, and Charles, shouldering the firm's debts, was hustled off to his first jail term. Marital status and parenthood notwithstanding—ultimately he and Clarissa, his wife, had five children—Goodyear was to serve several such terms. Philosophically, he utilized the periods to study chemistry.

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THE DISCOVERY MADE

The rubber products of that day became brittle in cold and gummy under heat. Goodyear's interest in finding a method of making India rubber capable of withstanding temperature extremes began in 1832, when, without scientific training, he tried to improve the rubberized clothing, shoes and life preservers made by the Roxbury Rubber Company, Roxbury, Connecticut. By treating rubber with sulphuric acid, he attained seeming success. In 1836 he hired a plant on Staten Island, opened a salesroom on nearby Broadway and secured a government contract to manufacture mailbags. His project collapsed when he found his rubber fabric to be useless under high temperatures.

Goodyear then worked with Nathaniel Hayward, a former employee of the Roxbury Rubber firm, who also was experimenting with sulphur and rubber. No success resulted, and the uncertain bread-winner wandered from town to town with Clarissa and their increasing brood. Living in desolate quarters, they were destitute, ill-nourished and sickly. Often Charles actually begged for food. Finally, William DeForrest, Goodyear's brother-in-law, took them into his Woburn, Massachusetts, home.

There, in 1839, on a day believed to have been February 23, the shivering family huddled close to the kitchen stove. Dull-eyed and miserable, they almost ignored the shabby Charles—looking

Partner with his father, pioneer hardware manufacturer

older than his 38 years—intently fiddling with his endless and noxious experiments. But his daughter saw a sudden glow of triumph spread over his face. Accidentally, he had dropped some India rubber mixed with sulphur on the red-hot stove.

A different version of the incident is that Clarissa—in a flare of rebellion against constant sacrifice—had forbidden Charles to pursue his experiments. Nevertheless, he secretly continued them. Upon her unexpected return from a visit, he tried to rid himself of the potion in the stove, spilling it on the hot lid. This version is unconfirmed.

His daughter, recalling her father's "look of exultation," continued: "He nailed the gum outside in the intense cold. Next morning . . . it was perfectly flexible. . . ."

ACCIDENT OR REWARD OF LABOR?

Goodyear and others had tried to "tan" or "cure" rubber—as leather was treated—to make it impervious to heat and cold. But on the stove his mixture had hardened rather than melted. Was it possible that a certain degree of high temperature would cancel out the effect of heat itself? He experimented along this line and nearly two years later filed a caveat of intention. He applied for a patent July 7, 1843, and June 14, 1844, it was granted.

In his two-volume autobiography – liberally flavored with rubber sales promotion and published by himself in 1853/5—Goodyear noted, "I was surprised . . . that a specimen [in] contact with a hot stove charred like leather. . . . If the charring . . . could be stopped at the right moment, it might [lose] its stickiness. . . . Upon further trials . . . I was convinced that my inference was sound."

The mark of the inventor's genius was his pursuit of this clue, for the application of heat to rubber was the reverse of existent scientific knowledge. Was his discovery accidental? Goodyear admitted "that [my] discoveries were not the result of scientific . . . investigation," but claimed that they evolved from "the closest application and observation" rather than accident.

Application and observation at terrible sacrifice! For ten years Goodyear had persisted, had seen "those dear to him . . . stripped of comforts . . . everything they possessed brought under the hammer." He had been driven to "the forlorn resort of the . . . pawnbroker's shop," and he had not hesitated to sell even his children's schoolbooks. "The *certainty of success* warranted the measure which in other circumstances would have been sacrilege."

And during that epochal yet terrible winter, while in Boston in a fruitless effort to get backers, he was jailed for failure to pay his $5 hotel bill. When released, he trudged 15 miles to Woburn and found his infant son, William, dying.

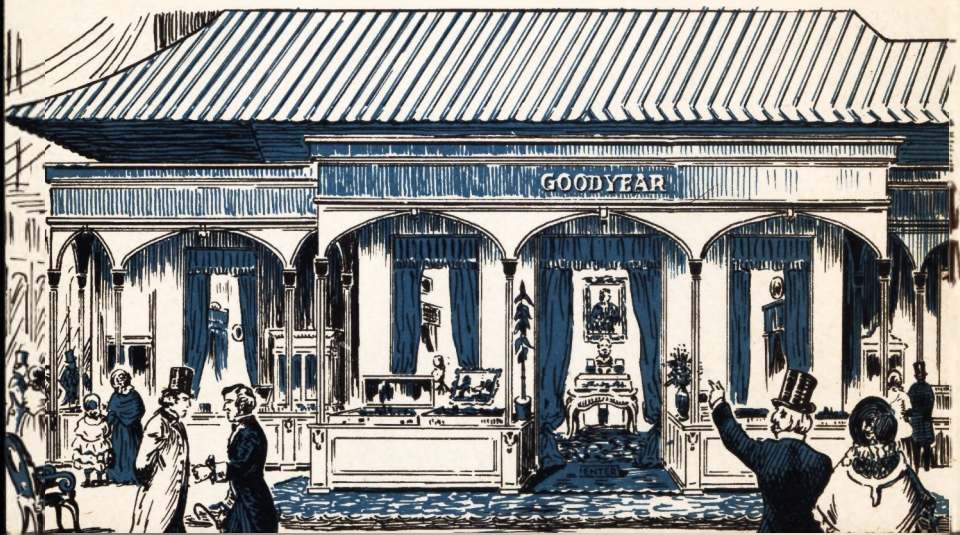
Destitute family sees Goodyear realize the secret of vulcanization

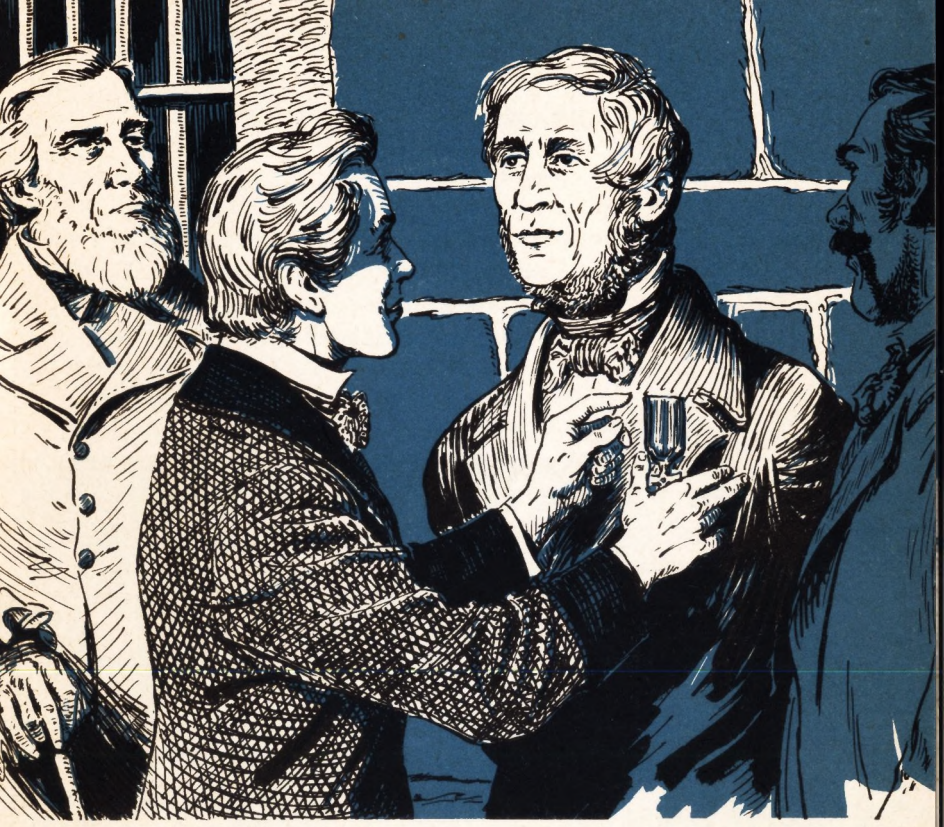
SUCCESS BRINGS LITTLE REWARD

Sometimes miracles happen. DeForrest and others financed the inventor's new process. Henry, Nelson and Charles, Jr.—far more practical than their father—operated factories at Naugatuck, Connecticut. By 1841 money was rolling in, and the inventor paid his staggering debts totaling $35,000. But, ever the incorrigible researcher, he was far more interested in finding proven uses for rubber than in money. He sold licenses and manufacturing rights at ridiculously low figures. Constantly beset with infringements, he remained convinced that the golden flood would never end.

In 1851 Goodyear staged a sensational $30,000 Vulcanite Court at the Crystal Palace International Exhibition in London. The display failed to establish his claims over those of a Briton named Thomas Hancock and thus win the right to open factories in England. For the same case in America, however, Goodyear retained Daniel Webster at a $25,000 fee and won a clean-cut victory. He had "persisted and finally succeeded" where others had failed, said the court.

Goodyear's $30,000 Vulcanite Court feature of London Exhibition





Inventor receives Legion of Honor Medal in Paris prison

The inventor's 1855 venture in France was as unfortunate as his English experience. At the Paris Exhibition his process received the Gold Medal. Emperor Louis Napoleon acclaimed him as the greatest American since Franklin and named him for the Cross of the Legion of Honor. But Goodyear's income from license fees could not match his $50,000 exhibition expense. Though ailing and on crutches, he was committed to the infamous Clitchy jail.

There, in an unheated cell, his son, Charles, pinned on his father's breast the Legion of Honor medal. Friends soon secured the inventor's release.

GOODYEAR THE GENIUS

In the quest of his goal Charles Goodyear spared neither himself nor those dearest to him. Overwork, hunger, broken health mattered not. He truly grieved at dragging his family through dire poverty, but, to him, the end he sought justified every sacrifice, and attainment always seemed close at hand. India rubber, or gum-elastic as he called it, was his obsession. If he had been

Vulcanization of tires in modern rubber factory

an artist, rubber would have been his art; if a philosopher, his thesis; if a preacher, his cause.

For in Goodyear's mind materialistic progress undoubtedly was tinged with a spiritual meaning. His daily world was comfortless, inconvenient and wasteful. Society yearned for the materialistic advantages which we enjoy and which, oddly enough, some of us think it fashionable to deride. But it was a world wakening from a long sleep through the magic of discovery and invention, and Goodyear's attitude toward rubber reveals a fuller understanding of the blessings of materialistic progress.

Speaking of himself in the third person, the inventor wrote, "The creature may imagine he is only executing some plan of his own, while he is the instrument in the hands of his Maker . . . to execute His purposes which, though we cannot fathom, we may believe, involve with the highest elevation of mind and morals, the . . . improvement of things material. . . .

"Independent of . . . pecuniary considerations, he [Goodyear] has taken great satisfaction in trying to improve articles . . . for the use of man. . . . Imperfections of these things . . . he considered as of great importance . . . not only the cause of much waste of time and money, but also productive of great moral evil. . . .

"In any case it has been necessity . . . and moral as well as pecuniary obligations, with the ambition of making these inventions worthy of this age of improvements, that has stimulated the inventor to proceed, step by step, to the completion of his plan."

Knowing that Goodyear once seriously considered entering the ministry, one sees clearly that he was possessed with the concentration, fervor and faith of a zealot. Money and fame meant nothing. His sole interest was achievement in the interests of progress and humanity. The discovery of vulcanization only spurred him to greater effort in his chosen medium of rubber. Not satisfied to settle on one rubber product and make a fortune, Goodyear, like a great artist, used his profits to "buy more paint," ever experimenting with and making new products. In 1853 he listed hundreds of uses for rubber under every conceivable heading.

GOODYEAR'S DEATH

Toward the end of his days the inventor's inattention to the realities of his manufacturing enterprise became alarming, and even his long-suffering family finally became annoyed with his obsession to *prove* that the uses of rubber were unlimited. By 1860 he was feeble, but in June he made a business trip to Washington. While there he received a message to hasten to New Haven where his daughter had become critically ill. He never reached his destination. On July 1 he was carried ashore from a coastal vessel at New York. Upon learning that his daughter had died, "he folded his tired hands and went to sleep."

Though widely thought to be worth millions, Goodyear died $200,000 in debt. Four years later, Charles, Jr., petitioned Congress to extend his father's patent rights so that the surviving family might profit. In recognition of the inventor's lifetime of struggle and of his heavy liabilities—all incurred for the "creation of [the] very improvements which have greatly enriched the world within these five years, and which must . . . still further . . . add untold millions to the wealth of man"—the request was granted.

GOODYEAR'S DREAM FULFILLED

Even Goodyear's vivid imagination did not foresee the extent to which posterity would vindicate his dream of thousands of rubber uses. Exhaustive as his ideas were, one searches vainly for mention of the rubber tire. Who in 1860—the day of ironbound

Fatally ill, Goodyear is carried from vessel in New York—1860

Goodyear's dream of manifold uses of rubber is realized

carriage and wagon wheels—could have foreseen the rubber-tired "horseless carriage"?

Could he return today, Charles Goodyear would see himself, because of his invention of vulcanization, hailed by all rubber companies as the father of the industry. He would see that one company, with which he and his family were never connected, was named in his honor.

He would delight in the millions of motor cars smoothly rolling on rubber But he would be puzzled to find materialistic progress — as he understood it — the subject of derision. His satisfaction would lie in the reality that one of the greatest benefits to society — rubber — had been realized.

MILLIONS ROLL ON RUBBER

Nearly all natural rubber comes from Ceylon, Malaya, the Philippines and other parts of the East and from Africa and Brazil.

After Pearl Harbor, 90 percent of our natural rubber supply from the East was cut off. Faced with this emergency, the United States developed a huge synthetic rubber industry. The estimated consumption of rubber in this country in 1953 reached the enormous total of 1,338,473 long tons —553,473 natural, and 785,000 synthetic.

Sales of rubber manufacturers in the United States are estimated at $5,000,000,000 annually. Tire and inner tube sales represent $1,821,338,000 of this total. In 1953 total shipments of tires in the United States were over 100 million units, 79,800,000 of which were for passenger cars and motor cycles, 14,900,000 for trucks and buses, 3,800,000 for farm tractors and implements, 1,200,000 industrial pneumatics, and 500,000 for airplanes.

Akron, Ohio, accurately is known as America's rubber center. Among the great rubber companies with headquarters and plants there are: Firestone Tire & Rubber Company (founded by Harvey Samuel Firestone), General Tire Company, B. F. Goodrich Company (founded by Dr. B. F. Goodrich who established the pioneer rubber factory there in 1869), Goodyear Tire & Rubber Company (named 60 years after his death in honor of Charles Goodyear, the inventor, who had no connection with it), and U. S. Rubber Company.

The rubber industry employs an average of 215,000 workers.

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